

2.1 HW Due 10-7-2016 Pg. 66 # 29, 34, 35, 43, 45, 47

$$\begin{aligned} 29. \quad \lim_{x \rightarrow 0} \left( \frac{(2+x)^3 - 8}{x} \right) &= \lim_{x \rightarrow 0} \left( \frac{x^3 + 6x^2 + 12x + 8 - 8}{x} \right) \\ &= \lim_{x \rightarrow 0} \left( \frac{x^3 + 6x^2 + 12x}{x} \right) = \lim_{x \rightarrow 0} (x^2 + 6x + 12) = 12 \end{aligned}$$

$$\begin{aligned} 34. \quad \lim_{x \rightarrow 5} \frac{x^3 - 125}{x - 5} &= \lim_{x \rightarrow 5} \frac{(x-5)(x^2 + 5x + 25)}{x-5} \\ &= \lim_{x \rightarrow 5} (x^2 + 5x + 25) = 5^2 + 5 \cdot 5 + 25 = 75 \end{aligned}$$

35. Use a graph to show  $\lim_{x \rightarrow 1} \frac{x^2 - 4}{x - 1}$ .

the graph reveals that  $\lim_{x \rightarrow 1^-} \frac{x^2 - 4}{x - 1} = \infty$

and  $\lim_{x \rightarrow 1^+} \frac{x^2 - 4}{x - 1} = -\infty$ , therefore,

$$\lim_{x \rightarrow 1} \frac{x^2 - 4}{x - 1} = \text{undefined}$$

43. a. True  
c. False  
e. True  
g. False  
i. False

- b. True  
d. True  
f. True  
h. False  
j. False

Pg. 66

45.

$$a. \lim_{x \rightarrow 3^-} f(x) = 3$$

$$b. \lim_{x \rightarrow 3^+} f(x) = -2$$

$$c. \lim_{x \rightarrow 3} f(x) = \text{undefined}$$

$$d. f(3) = 1$$

47.  $a. \lim_{h \rightarrow 0^-} f(h) = -4$

$$b. \lim_{h \rightarrow 0^+} f(h) = -4$$

$$c. \lim_{h \rightarrow 0} f(h) = -4$$

$$d. ~~f(0)~~ f(0) = -4$$